

**Section 94 Asphaltic Emulsions****4-9401 General**

Asphaltic emulsions are described in Section 94, “Asphaltic Emulsions,” of the *Standard Specifications*. They are used for bituminous seals and tack coat. Asphaltic emulsions are also used for other purposes, such as curing seals for lime stabilization and cement-treated base and for coating the surface of cement-treated permeable base to facilitate measuring the thickness of concrete pavement.

In addition to the specifications for asphaltic emulsions in Section 94, of the *Standard Specifications*, refer to the requirements for asphaltic emulsions in other sections of the *Standard Specifications* covering work in which asphaltic emulsions are used.

Refer to the *Tack Coat Guidelines* for more information at the following address:

<http://www.dot.ca.gov/hq/construc/>

**4-9402 Before Work Begins**

Before work begins, take the following steps:

- Verify the receipt and proper distribution of Form CEM-3101, “Notice of Materials to Be Used,” which covers asphaltic emulsion.
- Examine the distributor truck to ensure it meets the specified requirements.
- Ensure the contractor properly equips delivery trucks, storage tanks, and spreading equipment with specified devices for measuring volumes of asphaltic emulsion.

**4-9403 During the Course of Work**

During the work, take the following steps:

- If asphaltic emulsion is used before sampling and testing, obtain a Certificate of Compliance containing the specified information.
- Check the temperature of the asphaltic emulsion to ensure it is within the specified range when applied.
- Before applying asphaltic emulsion, ensure the surface to be treated is clean and dry.
- Ensure that asphaltic emulsion is not sprayed outside designated areas and that bituminous material does not drip from distribution equipment.
- Check the application rate of asphaltic emulsion to ensure the designated rate. After the first few hundred meters of application, check the initial spread rate. The frequency for checking the spread rate will depend on the accuracy and consistency of the first few checks. Record the spot-check results and the overall daily spread rate in the daily report.

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- Sample asphaltic emulsion in accordance with the table in Section 6-1, “Sample Types and Frequencies,” of the *Construction Manual* (manual) and the manual’s instructions in Section 6-202E, “Materials Accepted on the Basis of a Certificate of Compliance.” If water has been added to the asphaltic emulsion, note on Form TL-0101, “Sample Identification Card,” the ratio of added water to the total mixture.

#### **4-9404 Measurement and Payment**

Section 94, “Asphaltic Emulsions,” of the *Standard Specifications*, does not contain provisions for payment. Payment clauses for asphaltic emulsions are in the various sections covering work in which asphaltic emulsions are used.

Obtain weight tickets for deliveries of asphaltic emulsion.

It is a good practice, before the asphaltic emulsion is discharged, to measure the volume in the distributor and to make this volumetric measurement again whenever a partial load leaves the work. These actions result in a good check against scale weights, and the second measurement may be used if the contractor fails to submit a weight ticket for the unused asphaltic emulsion.

When the specifications provide for additional water to be mixed with asphaltic emulsion, it is necessary to determine the mass of asphaltic emulsion without the mass of the added water. Delivery weight tickets will show the mass of the emulsion before water was added and the total mass of asphaltic emulsion and added water.

When making volumetric measurements, measure the temperature, and apply the proper factors for converting volume to mass.

In a partial load using volumetric measurements, the procedure for determining the mass of asphaltic emulsion with added water is as follows:

1. Measure the volume and temperature of the mixture in the partial load. Calculate the volume of emulsion in the original load at the temperature of the partial load. Convert tonnes of added water in the original load to liters.
2. Based on the final temperature reading, calculate the ratio of the volume of asphaltic emulsion to the total volume in the original load.
3. Calculate the volume, at 15°C, of emulsion in the partial load.
4. Determine the mass of emulsion remaining in the partial load.

#### Example:

Assume the following:

- Weight ticket shows 10.00 t of emulsion and 5.00 t of added water. (Total = 15 t.) Temperature at time of weighing was 75°C.
- 2020 L of emulsion and added water remain in the partial load. At the time of measuring, the temperature of the mixture is 55°C.

Using these assumptions, calculate as follows:

1. Volume of emulsion (at 55°C) in the original load:

$10.00 \text{ t} \times 1002 \text{ L/t} @ 15^\circ\text{C} \div 0.98225$  (see the conversion table, Section 94-1.07, “Measurement,” of the *Standard Specifications*) = 10201 L

2. Volume of added water in the original load:  
 $5 \times 1000 = 5000 \text{ L}$
3. Ratio of volume of emulsion @ 55°C to total volume in the original load:  
 $10201/15201 = 0.671$
4. Volume @ 15°C of emulsion in the partial load:  
 $0.671 \times 2020 \times 0.98225 = 1331 \text{ L}$
5. Mass of emulsion in partial load:  
 $1331 \div 1002 = 1.33 \text{ t}$
6. Emulsion used on the project:  
 $10.00 - 1.33 = 8.67 \text{ t}$